

IN THE CLAIMS:

1. (original) A rechargeable lithium battery including a negative electrode made by sintering a layer of a mixture of active material particles containing silicon and/or a silicon alloy and a binder on a surface of a conductive metal foil current collector, a positive electrode and a nonaqueous electrolyte, characterized in that said nonaqueous electrolyte contains carbon dioxide dissolved therein.

2. (original) The rechargeable lithium battery as recited in claim 1, characterized in that said sintering is performed under a non-oxidizing atmosphere.

3. (original) A rechargeable lithium battery including a negative electrode made by sintering, on a surface of a conductive metal foil current collector, a layer of a mixture of a binder and active material particles having a tendency to undergo a porosity increase that advances inside from particle surfaces during charge and discharge, a positive electrode and a nonaqueous electrolyte, characterized in that said nonaqueous electrolyte contains carbon dioxide dissolved therein.

4. (currently amended) The rechargeable lithium battery as recited in ~~any one of claims 1-3~~ claim 1, characterized in that the amount of carbon dioxide dissolved in said nonaqueous electrolyte is at least 0.001 % by weight.

5. (currently amended) The rechargeable lithium battery as recited in ~~any one of claims 1-3~~ claim 1, characterized in that the amount of carbon dioxide dissolved in said nonaqueous electrolyte is at least 0.01 % by weight.

6. (currently amended) The rechargeable lithium battery as recited in ~~any one of claims 1-3~~ claim 1, characterized in that the amount of carbon dioxide dissolved in said nonaqueous electrolyte is at least 0.05 % by weight.

7. (currently amended) The rechargeable lithium battery as recited in ~~any one of claims 1-6~~ claim 1, characterized in that carbon dioxide is further contained in an inner space of the battery.

8. (currently amended) The rechargeable lithium battery as recited in ~~any one of claims 1-7~~ claim 1, characterized in that

said nonaqueous electrolyte contains a cyclic carbonate.

9. (currently amended) The rechargeable lithium battery as recited in ~~any one of claims 1-7~~ claim 1, characterized in that said nonaqueous electrolyte contains a mixed solvent of a cyclic carbonate and a chain carbonate.

10. (currently amended) The rechargeable lithium battery as recited in ~~claim 8 or 9~~ claim 8, characterized in that said cyclic carbonate includes ethylene carbonate and/or propylene carbonate.

11. (currently amended) The rechargeable lithium battery as recited in ~~claim 8 or 9~~ claim 8, characterized in that said cyclic carbonate is ethylene carbonate.

12. (currently amended) The rechargeable lithium battery as recited in ~~claim 8 or 9~~ claim 8, characterized in that said cyclic carbonate is propylene carbonate.

13. (currently amended) The rechargeable lithium battery as recited in ~~any one of claims 9-12~~ claim 9, characterized in that said chain carbonate includes at least one of dimethyl carbonate,

diethyl carbonate and methyl ethyl carbonate.

14. (currently amended) The rechargeable lithium battery as recited in ~~any one of claims 1 - 13~~ claim 1, characterized in that said nonaqueous electrolyte further contains a fluorine-containing compound.

15. (original) The rechargeable lithium battery as recited in claim 14, characterized in that said fluorine-containing compound is a fluorine-containing lithium salt.

16. (original) The rechargeable lithium battery as recited in claim 15, characterized in that said fluorine-containing lithium salt is LiXF_y (wherein X is P, As, Sb, B, Bi, Al, Ga or In; y is 6 if X is P, As or Sb and y is 4 if X is B, Bi, Al, Ga or In) or $\text{LiN}(\text{C}_m\text{F}_{2m+1}\text{SO}_2)(\text{C}_n\text{F}_{2n+1}\text{SO}_2)$ (wherein m and n are independently integers of 1 - 4).

17. (original) The rechargeable lithium battery as recited in claim 15, characterized in that said fluorine-containing lithium salt is at least one selected from LiPF_6 , LiBF_4 and $\text{LiN}(\text{C}_2\text{F}_5\text{SO}_2)_2$.

18. (currently amended) The rechargeable lithium battery as recited in ~~any one of claims 1—17~~ claim 1, characterized in that said active material particles have a mean particle diameter of 10 μm or below.

19. (currently amended) The rechargeable lithium battery as recited in ~~any one of claims 1—18~~ claim 1, characterized in that said current collector has an arithmetic mean surface roughness R_a of at least 0.2 μm .

20. (currently amended) The rechargeable lithium battery as recited in ~~any one of claims 1—19~~ claim 1, characterized in that said current collector comprises a copper foil, a copper alloy foil or a metal foil having a copper or copper alloy surface layer.

21. (currently amended) The rechargeable lithium battery as recited in ~~any one of claims 1—19~~ claim 1, characterized in that said current collector comprises an electrolytic copper foil, an electrolytic copper alloy foil or a metal foil having an electrolytic copper or copper alloy surface layer.

22. (currently amended) The rechargeable lithium battery as

recited in ~~any one of claims 1-21~~ claim 1, characterized in that said binder remains even after a heat treatment for the sintering.

23. (currently amended) The rechargeable lithium battery as recited in ~~any one of claims 1-22~~ claim 1, characterized in that said binder comprises polyimide.

24. (currently amended) The rechargeable lithium battery as recited in ~~any one of claims 1-23~~ claim 1, characterized in that said active material particles are composed of silicon.

25. (currently amended) The rechargeable lithium battery as recited in ~~any one of claims 1-24~~ claim 1, characterized in that an electric conductor is mixed in said mixture layer.

26. (original) A method for fabricating a rechargeable lithium battery including a negative electrode, a positive electrode and a nonaqueous electrolyte, characterized as comprising the steps of:

providing a layer of a mixture of active material particles containing silicon and/or a silicon alloy and a binder on a surface of a conductive metal foil as a current collector and sintering the mixture layer while being placed on said surface of the conductive

metal foil to prepare said negative electrode;

dissolving carbon dioxide in said nonaqueous electrolyte; and

assembling a rechargeable lithium battery using said negative electrode, positive electrode and nonaqueous electrolyte.

27. (original) The method for fabricating a rechargeable lithium battery as recited in claim 26, characterized in that said sintering is performed under a non-oxidizing atmosphere.

28. (currently amended) The method for fabricating a rechargeable lithium battery as recited in ~~claim 26 or 27~~ claim 26, characterized in that the step of dissolving carbon dioxide in the nonaqueous electrolyte includes a step of blowing gaseous carbon dioxide into the nonaqueous electrolyte.

29. (currently amended) The method for fabricating a rechargeable lithium battery as recited in ~~any one of claims 26~~ 28 claim 26, characterized in that the step of assembling a rechargeable lithium battery includes a step of assembling a rechargeable lithium battery under the atmosphere including carbon dioxide.